

Work Order ID 148710

Wednesday, July 06, 2016 8:43:23 AM

148710

U/R

Page 1

Item ID: D412-596-203 Accept *N900040100* Setup Start *NS1*
 Revision ID: URF 14-644 Stop *NS2*
 Item Name: Stainless Steel Aft Crosstube - Extended Height 39"
 Start Date: 7/13/2016 Start Qty: 1.00 *1* Cust Item ID:
 Required Date: 7/29/2016 Req'd Qty: 1.00 *1* Customer:
 Reference:

Approvals: Process Plan: DAS 21 9-89 Date: JUL 11 2016 Tooling: _____ Date: _____ Run Start *NR1*
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D412-596-203	B U/R <u>OK Q</u> <u>16/7/14</u>								
100	Document Control	0.00							
100	DOCUMENT CONTROL								
DC	Memo	0.00							
Doc.Control -USB or Paperwork	Photocopy bluefile & type labels per PPPD412-596-203		CHG001						<u>Smb</u> <u>16/8/14</u>
110		0.02							
110	BENDING MACHINE - CROSSTUBES								
CNC Bend 2	Memo	0.52							
CNC Alpha 160 Bender	Bend tube as per Dwg D412-596-203 using CNC bender program _____ and Folio FT _____								<u>Ju</u> <u>16-07-21</u>
	****USE (4) DT9824 SHIM BLOC TO CHECK STRAIGHTNESS****								
127	QC15- Crosstube Dimensional Check	0.00							
127									
QC	Memo	0.00							
Quality Control	***MARK CUT LINES***								<u>①</u> <u>16-07-21</u> <u>PD</u>

D412-664-203/148710

DQA:

Date: 2016-10-7



QA Closed:

Date:

SEP 28 2015 WORK ORDER NON-CONFORMANCE / UPDATE

Work Order update only ☐

Work Order: 148716		DISPOSITION		AGAINST DEPARTMENT/PROCESS					
Part No. D412-S96-203		Rework ☐		Skid-tube ☐	Cross tube ☒	Water Jet ☐	Engineering ☐		
NCR No. 16-6056		Scrap ☐		Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐		
		Use-as-is ☒		Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐		
		Suspected Unapproved ☐		Large Fab ☐	Composite ☐	Supplier ☐			
Date: 16/7/21	Step #: 110	QTY Effective: 1					MRB (QSI042) Approval		
Description Work Order Deviation		Disposition					DAS 12 9-89 16/7/21 Completed By DAS 12 9-89 16/7/21 Lead hand / Supervisor Approval Verification DAS 9 9-89 16-09-23 QC / QA Coordinator Approval PD 16-02-21		
Tube bent under tolerance. Total span - 0.35 under nominal.		Acceptable. Cut at 36.18"							
Root Cause		FAULT CATEGORY							
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐				
Design ☐	Operator ☒	Bending ☒	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐				
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐				
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐				
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐				
Material ☒	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐				
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐				
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐				
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐				
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐				
Past Expiry Date ☐	Manufacturing Process ☐								
Misidentified ☐	Past Due ☐	OTHER :							

Work Order ID 148710

Wednesday, July 06, 2016 8:43:23 AM

148710

Page 2

Item ID: D412-596-203

Accept

N900040100

Setup Start

NS1

Revision ID: URF 14-644

Item Name: Stainless Steel Aft Crosstube - Extended Height 39"

Stop

NS2

Start Date: 7/13/2016 Start Qty: 1.00

1

Cust Item ID:

Required Date: 7/29/2016 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

NR1

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
128		0.00							
128									
Crosstubes									
Crosstubes									
	Memo	0.17							
	CUT TUBE AT HEIGHT ON FAI SHEET								
	VERF HEIGHT <u>34.75</u> BY QC 15 LEVEL INSPECTOR <u>PD</u>								
	VERF TWIST <u>3.150</u> BY QC15 LEVEL INSPECTOR <u>PD</u>								
130		0.00							
130									
Crosstubes									
Crosstubes									
	Memo	0.36							
	1- Engrave Part # and Batch # as per Dwg D412-596-203								
	2-Remove all marks from tube within limits of D412-596-203 DWG.								
140		0.00							
140									
QC									
Quality Control									
	QC6- Inspect dimensions to drawing	0.00							
	Memo	0.00							

DAS
38
9-89

JUL 26 2016

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐
OTHER : _____					

Work Order ID 148710

Wednesday, July 06, 2016 8:43:23 AM

148710

Page 3

Item ID: D412-596-203**Accept*****N900040100*****Setup Start*****NS1*****Revision ID:** URF 14-644**Stop*****NS2*****Item Name:** Stainless Steel Aft Crosstube - Extended Height 39"**Start Date:** 7/13/2016 **Start Qty:** 1.00 ***1*****Cust Item ID:****Required Date:** 7/29/2016 **Req'd Qty:** 1.00 ***1*****Customer:****Reference:****Approvals:** **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____**Run Start*****NR1*****QC:** _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____**Stop*****NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
174	Outsource process - NDT per QSI038 4.1	0.00							
174									
Outsource2	Memo	30.00							
Outsource process - NDT	ISSUE P/O TO ACCUREN: <u>33169</u>								
176	Receive & Inspect for Damage & Mat'l Certs	0.00							
176									
Packaging	Memo	0.00							
Packaging									
178	QC5- Inspect part completeness to step on W/O	0.00							
178									
QC	Memo	0.00							
Quality Control	<u>50.00 148710</u>								

DAS
16
9-8916/07/09

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐
OTHER : _____					

Work Order ID 148710

Wednesday, July 06, 2016 8:43:23 AM

148710

Page 4

Item ID: D412-596-203 Accept ***N900040100*** Setup Start ***NS1***
Revision ID: URF 14-644 Stop ***NS2***
Item Name: Stainless Steel Aft Crosstube - Extended Height 39"
Start Date: 7/13/2016 Start Qty: 1.00 ***1*** Cust Item ID:
Required Date: 7/29/2016 Req'd Qty: 1.00 ***1*** Customer:
Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180	SprayPaint	0.00							DAS 41 9-89
180 SprayPaint Spray Painting	Memo ***USE AXALTA 230S PRE-TREATMENT AS PER QSI005*** AXALTA BATCH: <u>132474</u> 1-Prime inside & outside crosstube as per QSI 005 4.2 BATCH: <u>134602</u> 2- After painting remove masking and apply matte clear coat per QSI005 4.2 BATCH: <u>134901</u> 3- MASK UNDERSIDE OF CROSSTUBE AS SHOWN ON DWG BEFORE PAINTING 4 -Paint Outside of Tube as per Dart QSI 005 4.2 BATCH: <u>135064</u>	0.05				<u>1</u>			16-8-8
190	QC14- Inspect Spray Paint	0.00							DAS 16 9-89
190 QC Quality Control	<u>Scrubbed 148710</u> Memo	0.00							16-8-8

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐
OTHER : _____					

Work Order ID 148710

Wednesday, July 06, 2016 8:43:23 AM

148710

Page 5

Item ID: D412-596-203

Accept

N900040100

Setup Start

NS1

Revision ID: URF 14-644

Stop

NS2

Item Name: Stainless Steel Aft Crosstube - Extended Height 39"

Start Date: 7/13/2016 Start Qty: 1.00

1

Cust Item ID:

Required Date: 7/29/2016 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

NR1

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
200	Crosstubes	0.00							DAS
200						1			41
Crosstubes									9-89
Crosstubes									16-8-9
	Memo	0.26							
	1- Install center support using scoth-weld DP460 per QSI 015, as per DWG. note 12. A/R scoth-weld DP460 BATCH #: <u>133505</u> 11/16								
	2- Install clamp with rubber cushion as per DWG. note 13								
	3- Abrade mating surfaces of support and crosstube with 400 grit sandpaper, clean the area with 4105S wash 'n' wipe								
	4- **IF NOT ALREADY PRESENT ON CHAFFING SHEILD.** Apply a thin coat of proseal 890 per QSI 015 on inside concave surface of chafing shield and let cure per manufacturer's instructions. Install prosealed chafing shield onto crosstube by applying a thin coat of proseal 890 onto crosstube. Be sure to eliminate any air gaps. A/R Proseal 890 Batch: <u>135390</u> 27p 10/16								
	5- Install supports clamps using DT _____ as per Dwg D412-596-203, Torque clamps on support to 80-100 IN-LBS. Torque clamps on chafing shield to 40-50 IN-LBS.								
	START CURE TIME: <u>16-8-9</u> FINISH CURE TIME: <u>16-8-10</u>								
	PRIOR TO PACKAGING RE-CHECK TORQUE ON CLAMPS AFTER CURED FOR 24H.								

DQA: dat Date: 2016-10-7



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: Date:

Work Order update only



Work Order: <u>148710</u> Part No. <u>D412-S96-203</u> NCR No.		DISPOSITION Rework ☒ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width:100%; border: none;"> <tr> <td style="border: none;">Skid-tube ☐</td> <td style="border: none;">Cross tube ☐</td> <td style="border: none;">Water Jet ☐</td> <td style="border: none;">Engineering ☐</td> </tr> <tr> <td style="border: none;">Machining ☐</td> <td style="border: none;">Small Fab ☐</td> <td style="border: none;">Prod. Eng. Coord. ☐</td> <td style="border: none;">Quality ☐</td> </tr> <tr> <td style="border: none;">Thermoforming ☐</td> <td style="border: none;">Finishing ☐</td> <td style="border: none;">Rec/Store/Packaging ☐</td> <td style="border: none;">Other ☐</td> </tr> <tr> <td style="border: none;">Large Fab ☐</td> <td style="border: none;">Composite ☐</td> <td style="border: none;">Supplier ☐</td> <td></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐																																															
Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐																																																																				
Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐																																																																				
Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐																																																																				
Large Fab ☐	Composite ☐	Supplier ☐																																																																					
Date: <u>16/7/14</u>		Step #: <u>200</u>		QTY Effective: <u>1</u>		MRB (QSI042) Approval DAS 12 9-89 <u>14/7/14</u>																																																																	
Description Work Order Deviation <u>Install MS21920 CLAMP so MECHANISM IS ON TOP OF CRUSSTUBE.</u>				Disposition <u>ACCEPTABLE.</u>		Completed By DAS 12 9-89 <u>16/7/14</u>																																																																	
						Lead hand / Supervisor Approval Verification DAS 9 9-89 <u>16.03.17</u>																																																																	
						QC / QA Coordinator Approval DAS 9 9-89 <u>16.03.17.</u>																																																																	
Root Cause <table style="width:100%; border: none;"> <tr> <td style="border: none;">Environment ☐</td> <td style="border: none;">No Re-verification ☐</td> </tr> <tr> <td style="border: none;">Design ☐</td> <td style="border: none;">Operator ☐</td> </tr> <tr> <td style="border: none;">Doc/Data ☒</td> <td style="border: none;">Offset/Setup ☐</td> </tr> <tr> <td style="border: none;">Equip/Tooling ☐</td> <td style="border: none;">Supplier ☐</td> </tr> <tr> <td style="border: none;">Handling/Pre ☐</td> <td style="border: none;">Training ☐</td> </tr> <tr> <td style="border: none;">Material ☐</td> <td style="border: none;">Use for Testing ☐</td> </tr> <tr> <td style="border: none;">Internal Transport ☐</td> <td style="border: none;">Poor Information ☐</td> </tr> <tr> <td style="border: none;">Tribal Knowledge ☐</td> <td style="border: none;">Rushing ☐</td> </tr> <tr> <td style="border: none;">LOA ☐</td> <td style="border: none;">Product Improvement ☐</td> </tr> <tr> <td style="border: none;">Substation ☐</td> <td style="border: none;">Process Improvement ☐</td> </tr> <tr> <td style="border: none;">Past Expiry Date ☐</td> <td style="border: none;">Manufacturing Process ☐</td> </tr> <tr> <td style="border: none;">Misidentified ☐</td> <td style="border: none;">Past Due ☐</td> </tr> </table>				Environment ☐	No Re-verification ☐	Design ☐	Operator ☐	Doc/Data ☒	Offset/Setup ☐	Equip/Tooling ☐	Supplier ☐	Handling/Pre ☐	Training ☐	Material ☐	Use for Testing ☐	Internal Transport ☐	Poor Information ☐	Tribal Knowledge ☐	Rushing ☐	LOA ☐	Product Improvement ☐	Substation ☐	Process Improvement ☐	Past Expiry Date ☐	Manufacturing Process ☐	Misidentified ☐	Past Due ☐	FAULT CATEGORY <table style="width:100%; border: none;"> <tr> <td style="border: none;">Pressure/Forced ☐</td> <td style="border: none;">Temperature/Cure ☐</td> <td style="border: none;">Power Loss/Surge ☐</td> <td style="border: none;">Positioned Wrong ☐</td> </tr> <tr> <td style="border: none;">Bending ☐</td> <td style="border: none;">Set-up ☐</td> <td style="border: none;">Folio/Program ☐</td> <td style="border: none;">Outside Dimensions ☐</td> </tr> <tr> <td style="border: none;">Centre Not Concentric ☐</td> <td style="border: none;">BOM/Route ☐</td> <td style="border: none;">Grain ☐</td> <td style="border: none;">Over/Under tolerance ☐</td> </tr> <tr> <td style="border: none;">Cracks ☐</td> <td style="border: none;">Broken/Damage/Defect ☐</td> <td style="border: none;">Weld ☐</td> <td style="border: none;">Part Incorrect ☐</td> </tr> <tr> <td style="border: none;">Crimp/Kink/Ripple/Wave ☐</td> <td style="border: none;">Inspection Incomplete/Unqualified ☐</td> <td style="border: none;">Wrong Stock Pulled ☐</td> <td style="border: none;">Part Lost/Missing ☐</td> </tr> <tr> <td style="border: none;">Cuffs ☐</td> <td style="border: none;">Contamination ☐</td> <td style="border: none;">Out of Sequence ☐</td> <td style="border: none;">Part Moved ☐</td> </tr> <tr> <td style="border: none;">Crushing ☐</td> <td style="border: none;">Countersink ☐</td> <td style="border: none;">Off-set ☐</td> <td style="border: none;">☒ Drawing ☐</td> </tr> <tr> <td style="border: none;">Heat Treat ☐</td> <td style="border: none;">Cut Too Short ☐</td> <td style="border: none;">Mislabeled ☐</td> <td style="border: none;">Finish ☐</td> </tr> <tr> <td style="border: none;">Wave/Twist in Tube ☐</td> <td style="border: none;">Instructions Incomplete/Unclear ☐</td> <td style="border: none;">Fit/Function ☐</td> <td style="border: none;">Misread ☐</td> </tr> <tr> <td style="border: none;">Marks/Chatter ☐</td> <td style="border: none;">Drill Holes ☐</td> <td style="border: none;">Misaligned/off center ☐</td> <td style="border: none;">Turning Sequence ☐</td> </tr> </table>				Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐	Crushing ☐	Countersink ☐	Off-set ☐	☒ Drawing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐
Environment ☐	No Re-verification ☐																																																																						
Design ☐	Operator ☐																																																																						
Doc/Data ☒	Offset/Setup ☐																																																																						
Equip/Tooling ☐	Supplier ☐																																																																						
Handling/Pre ☐	Training ☐																																																																						
Material ☐	Use for Testing ☐																																																																						
Internal Transport ☐	Poor Information ☐																																																																						
Tribal Knowledge ☐	Rushing ☐																																																																						
LOA ☐	Product Improvement ☐																																																																						
Substation ☐	Process Improvement ☐																																																																						
Past Expiry Date ☐	Manufacturing Process ☐																																																																						
Misidentified ☐	Past Due ☐																																																																						
Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐																																																																				
Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐																																																																				
Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐																																																																				
Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐																																																																				
Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐																																																																				
Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐																																																																				
Crushing ☐	Countersink ☐	Off-set ☐	☒ Drawing ☐																																																																				
Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐																																																																				
Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐																																																																				
Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐																																																																				
OTHER :																																																																							

Work Order ID 148710

Wednesday, July 06, 2016 8:43:23 AM

148710

Page 6

Item ID: D412-596-203**Accept*****N900040100*****Setup Start*****NS1*****Revision ID:** URF 14-644**Stop*****NS2*****Item Name:** Stainless Steel Aft Crosstube - Extended Height 39"**Start Date:** 7/13/2016 **Start Qty:** 1.00 ***1*****Cust Item ID:****Required Date:** 7/29/2016 **Req'd Qty:** 1.00 ***1*****Customer:****Reference:****Approvals:** **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____**Run Start*****NR1*****QC:** _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____**Stop*****NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

210

QC5- Inspect part completeness to step on W/O

0.00

210

QC

Memo

0.00

Quality Control

PRIOR TO PACKAGING RE-CHECK TORQUE ON CLAMPS AFTER
CURED FOR 24H.DAS
38
9-89

AUG 1 1 2016

240

Packaging

0.00

240

Packaging

Memo

0.00

Packaging

Identify and pack for shipping as per PPPD412-596-203

Location: _____

PPP Rev: _____

sold

1

SmB
16/8/14DAS
21
9-89

AUG 1 5 2016

250

QC21- Final Inspection - Work Order Release

0.00

250

QC

Memo

0.02

Quality Control

SJA

AUG 1 5 2016

AUG 5 1 2016

AUG 1 5 2016

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐
OTHER : _____					

Picklist Print

Wednesday, July 06, 2016 8:43:22 AM

Page 1

Work Order ID: 148710

148710

Parent Item: D412-596-203

D412-596-203

Parent Item Name: Stainless Steel Aft Crosstube - Extended Height 39"

Start Date: 7/13/2016

Required Date: 7/29/2016

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP REV:A NEW ISSUE JFS 13/03/22 VERIFY BY:DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D3595-063-530

Manufactured

No

Each

30.0000

2

DAS

D3595-063-530

**

41

9-89

16-8-8

Rubber Cushion 0.63" wide x 5.30" Long

Location

Loc Qty

Loc Code

FG

1

82656

1

LG051

1

132515

1

LG052

28

138921

7

144882

21

2

D412-596-203TRN

Manufactured

No

110

Each

4.0000

1

1

D412-596-203TRN

**

Crosstube Aft Extended Turning Detail

Location

Loc Qty

Loc Code

LG003

4

135132

1

135133

1

135134

1

135135

1

16-07-19

D4909-1

Manufactured

No

Each

6.0000

1

DAS

D4909-1

**

41

9-89

16-8-8

Support

Location

Loc Qty

Loc Code

LG053

6

135507

2

140154

4

1

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					

Root Cause				FAULT CATEGORY			
Environment ☐	☐	No Re-verification ☐		☐	Pressure/Forced	☐	Temperature/Cure
Design ☐	☐	Operator ☐		☐	Bending	☐	Set-up
Doc/Data ☐	☐	Offset/Setup ☐		☐	Centre Not Concentric	☐	BOM/Route
Equip/Tooling ☐	☐	Supplier ☐		☐	Cracks	☐	Broken/Damage/Defect
Handling/Pre ☐	☐	Training ☐		☐	Crimp/Kink/Ripple/Wave	☐	Inspection Incomplete/Unqualified
Material ☐	☐	Use for Testing ☐		☐	Cuffs	☐	Contamination
Internal Transport ☐	☐	Poor Information ☐		☐	Crushing	☐	Countersink
Tribal Knowledge ☐	☐	Rushing ☐		☐	Heat Treat	☐	Cut Too Short
LOA ☐	☐	Product Improvement ☐		☐	Wave/Twist in Tube	☐	Instructions Incomplete/Unclear
Substation ☐	☐	Process Improvement ☐		☐	Marks/Chatter	☐	Drill Holes
Past Expiry Date ☐	☐	Manufacturing Process ☐		OTHER :			
Misidentified ☐	☐	Past Due ☐					

Picklist Print

Wednesday, July 06, 2016 8:43:22 AM

Page 2

Work Order ID: 148710

148710

Parent Item: D412-596-203

D412-596-203

Parent Item Name: Stainless Steel Aft Crosstube - Extended Height 39"

Start Date: 7/13/2016

Required Date: 7/29/2016

Start Qty: 1.00

Required Qty: 1.00

D4910-1 Manufactured No

Each 13.0000 2

D4910-1

DAS
41
9-89

16-8-8

Chaffing Shield

Location

Loc Qty

Loc Code

LG053

13

139520

4

2

141315

9

MS21920-26 Purchased No

Each 39.0000 4

MS21920-26

DAS
41
9-89

16-8-8

Clamp

Location

Loc Qty

Loc Code

LG050

16

M134502

16

LG057

23

M132045

1

M133234

2

M133577

20

4

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
OTHER : _____					

Picklist Print

Wednesday, July 06, 2016 8:43:22 AM

Page 3

Work Order ID: 148710

148710

Parent Item: D412-596-203

D412-596-203

Parent Item Name: Stainless Steel Aft Crosstube - Extended Height 39"

Start Date: 7/13/2016

Required Date: 7/29/2016

Start Qty: 1.00

Required Qty: 1.00

MS21920-28

Purchased

No

Each

143.0000

2

DAS

MS21920-28

41

9-89

16-8-8

Clamp

Location

Loc Qty

Loc Code

FG

1

105884

1

LG050

138

M135007

63

2

M135008

25

M135009

50

LG051

1

M132169

1

LG057

2

M134130

2

ST5543

1

M134590

1

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE



QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering/ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval 		
Description Work Order Deviation				Disposition					
							Completed By		
							Lead hand / Supervisor Approval Verification		
							QC / QA Coordinator Approval		

Root Cause				FAULT CATEGORY			
Environment ☐		No Re-verification ☐		Pressure/Forced ☐		Temperature/Cure ☐	
Design ☐		Operator ☐		Bending ☐		Set-up ☐	
Doc/Data ☐		Offset/Setup ☐		Centre Not Concentric ☐		BOM/Route ☐	
Equip/Tooling ☐		Supplier ☐		Cracks ☐		Broken/Damage/Defect ☐	
Handling/Pre ☐		Training ☐		Crimp/Kink/Ripple/Wave ☐		Inspection Incomplete/Unqualified ☐	
Material ☐		Use for Testing ☐		Cuffs ☐		Contamination ☐	
Internal Transport ☐		Poor Information ☐		Crushing ☐		Countersink ☐	
Tribal Knowledge ☐		Rushing ☐		Heat Treat ☐		Cut Too Short ☐	
LOA ☐		Product Improvement ☐		Wave/Twist in Tube ☐		Instructions Incomplete/Unclear ☐	
Substation ☐		Process Improvement ☐		Marks/Chatter ☐		Drill Holes ☐	
Past Expiry Date ☐		Manufacturing Process ☐		OTHER : _____			
Misidentified ☐		Past Due ☐					

Item	Qty -203	Part Number	Description
1	X	D412-596-203	CROSSTUBE ASSEMBLY (412 HI HI AFT)
2	1	D6020-170	CROSSTUBE MATERIAL
3	2	D3595-063-530	RUBBER CUSHION
4	1	D4909-1	SUPPORT
5	2	D4910-1	CHAFING SHIELD
7	4	MS21920-26	CLAMP
8	2	MS21920-28	CLAMP
9	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD
10	A/R	PROSEAL 890	SEALANT

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6020-170
FINISHED LENGTH = 161.38±0.060 (BEFORE BENDING/TRIMMING)
- 2) FINISH: PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN B6-2, HATCHED AREA)
PAINT OUTSIDE PER DART QSI 005 4.2
AFTER PAINTING, REMOVE MASKING AND APPLY MATTE CLEAR COAT PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART P/N 'D412-596-203' AND B/N ON INSIDE OF CUFF PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 191.1 lb RAW MATERIAL, 118.3 lb AFTER MACHINING
118.0 lb FINISHED WEIGHT
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

BENDING

- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7% (BASED ON O.D.) IN LOWER HALF OF R35 BEND AND 6% (BASED ON O.D.) ON REMAINING TUBE.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038. TO BE PERFORMED AFTER FINAL POST-BEND GRINDING. ANY ADDITIONAL GRINDING REQUIRES ANOTHER LPI INSPECTION.

ASSEMBLY

- 12) INSTALL D4909-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015.
- 13) INSTALL MS21920-28 CLAMPS WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D4909-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) IF NOT ALREADY PRESENT ON CHAFING SHIELD, APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D4910-1 CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEALED D4910-1 CHAFING SHIELD ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.
- 15) TORQUE CLAMPS ON D4909-1 SUPPORT 80 TO 100 IN-LB. TORQUE CLAMPS ON D4910-1 CHAFING SHIELD 40 TO 50 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVES HAVE CURED FOR 24 HOURS.

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER

NO. 148710 MJS
160711

UNDER REVIEW OK
11/17/13 9/14/14
JURE M-601

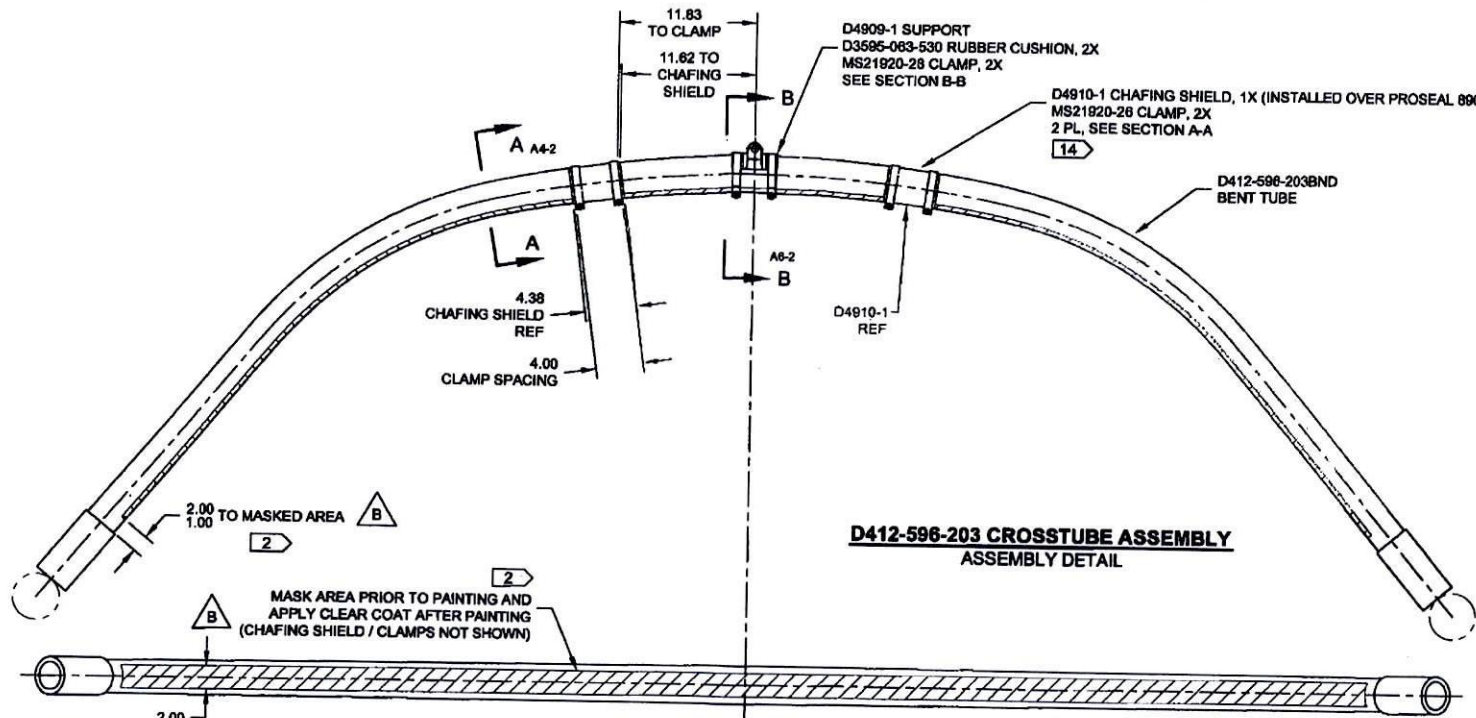
UNDER REVIEW

11/15/13
WZF 15-561

RELEASED
2013-08-06
MJP

B	ADD INSPECTION WINDOW (ZN C8-1, B6-2)	CP	13.06.16
A	NEW ISSUE	CP	13.03.13
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN	JP		
CHECKED	JP		
MFG. APPR.	JP		
APPROVED	JP		
DE APPR.	JP		
DATE	13.06.16		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D412-596-203	REV. B SHEET 1 OF 4
TITLE CROSSTUBE ASSY (412 HI HI AFT)	SCALE NTS
COPYRIGHT © 2013 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR REPRODUCED IN ANY FORM WITHOUT THE WRITTEN PERMISSION FROM DART AEROSPACE LTD.	



D412-596-203 CROSSTUBE ASSEMBLY
ASSEMBLY DETAIL

2.00 TO MASKED AREA
2
MASK AREA PRIOR TO PAINTING AND
APPLY CLEAR COAT AFTER PAINTING
(CHAFING SHIELD / CLAMPS NOT SHOWN)

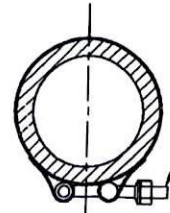
12
APPLY 3M SCOTCH-WELD DP460
BETWEEN D4909-1 SUPPORT AND
THE CROSSTUBE

D4909-1
SUPPORT
REF
D3595-063-530
RUBBER CUSHION
UNDER CLAMP, REF

13 15
MS21920-28
CLAMP, REF

SECTION B-B D4-2
SCALE 4X

*Mechanism
on
top
9/16/7/14*

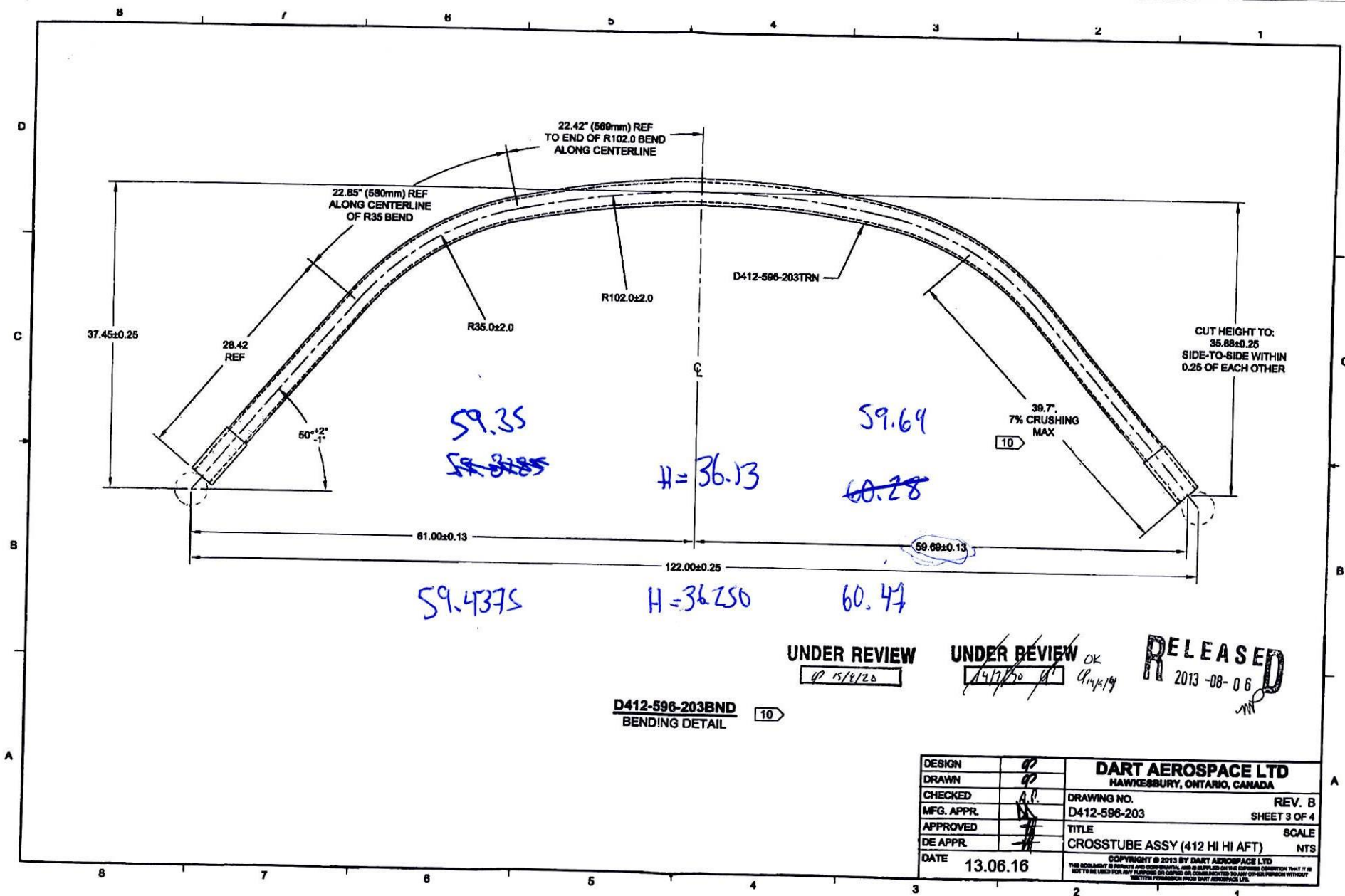


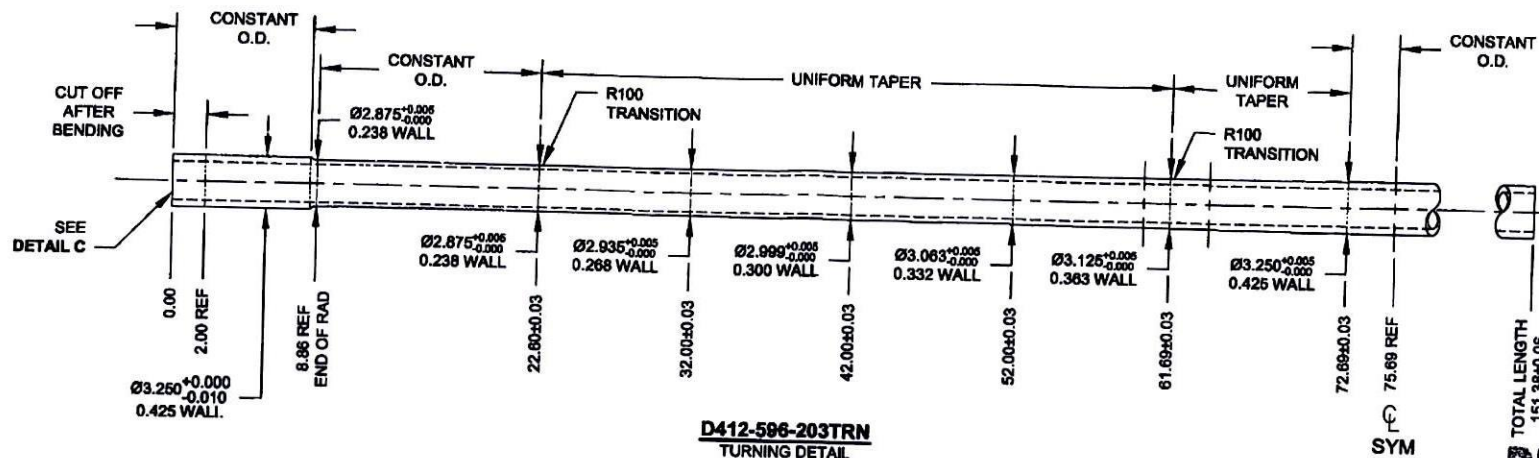
SECTION A-A C6-2
SCALE 4X

15
MS21920-26 CLAMP
REF

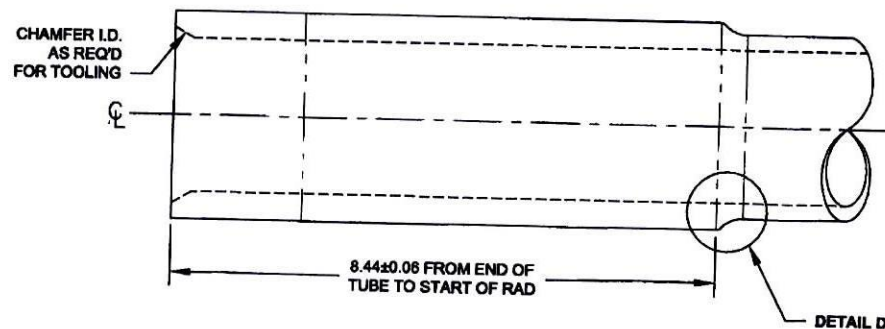
UNDER REVIEW
14/7/16
14/5/14
UNDER REVIEW
15/4/16
RELEASED
2013-08-06

DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. B
MFG. APPR.		D412-596-203	SHEET 2 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASSY (412 HI HI AFT)	NTS
DATE	13.06.16	COPYRIGHT © 2013 BY DART AEROSPACE LTD	
THIS DOCUMENT IS PROPRIETARY AND CONFIDENTIAL. NO REPRODUCTION OR DISSEMINATION OF THIS DOCUMENT IS PERMITTED WITHOUT THE WRITTEN PERMISSION FROM DART AEROSPACE LTD.			

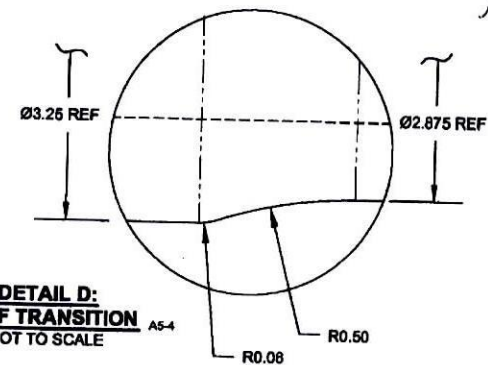




D412-598-203TRN
TURNING DETAIL



DETAIL C:
CUFF TRANSITION C8-4
SCALE 4X



DETAIL D:
CUFF TRANSITION A5-4
NOT TO SCALE

UNDER REVIEW

47 15/4/25

DESIGN	47	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	47		
CHECKED	47	DRAWING NO.	REV. B
MFG. APPR.	47	D412-598-203	SHEET 4 OF 4
APPROVED	47	TITLE	SCALE
DE APPR.	47	CROSSTUBE ASSY (412 HI HI AFT)	NTS
DATE	13.06.16	COPYRIGHT © 2013 BY DART AEROSPACE LTD THIS DOCUMENT IS UNCLASSIFIED AND IS NOT TO BE USED FOR ANY PURPOSES OR FOR ANY OTHER PERFORMANCE WITHOUT PERMISSION FROM DART AEROSPACE LTD.	

CK 4/14/14

UNDER REVIEW

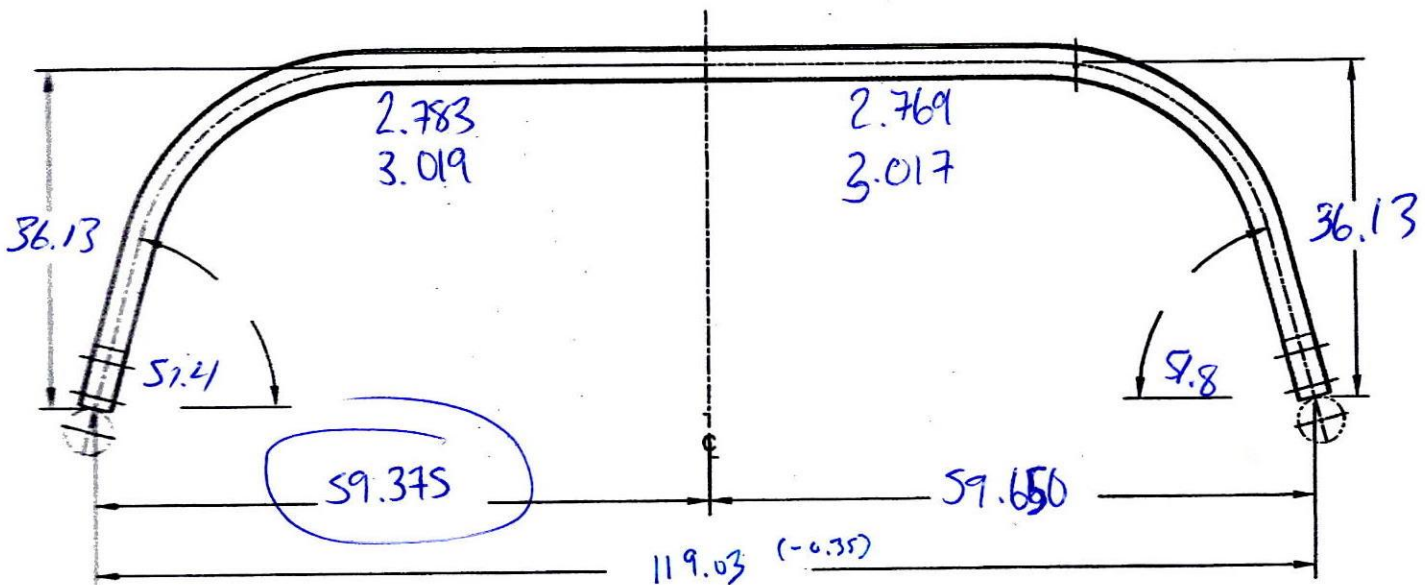
RELEASED

2013-08-06

148710

DART AEROSPACE LTD	Work Order: 148993
Description: Stainless Steel AFT Crosstube Extended H. 5' 9"	Part Number: D412-596-203
Inspection Dwg: D412-596-203 Rev: B UIR.	Page 1 of 1

Required Dimension	Min	Max
Height	35.63	36.13
1/2 Span	59.56	59.82
Angle	99	52
Total Span	119.12	119.64
Bending Passes	8	
Crushing	-	7%



	Side A	Side B
Bending Passes	25	33
Crushing	4%	4.3%
Comments		

QC15 Inspection	DD
Date	16-07-21

Rev	Date	Change	Revised by	Approved
A		New Issue		
B	06.09.19	Reformat; QC level revised	KJ/JM	
C	07.02.06	Reformat	KJ/JM	
D	12.02.15	Added bending passes and crushing	KJ	
E	12.03.07	Revised comments table	KJ	



skyservice Work Order Traveler

Sky Service F.B.O. Inc.

DOT APP 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO28940	Customer: Dart Aerospace Ltd	Dept: NDT YUL	Reference: 33169
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN:	CSN:	TSO:	
Task: UNSCHEDULED			Sequence: 1

Work Required:

CARRY OUT NDT INSPECTION (LIQUID PENETRANT) ON 8 CROSSTUBES

ITEM ID: D412-596-203 STAINLESS STEEL AFT CROSSTUBE - EXTENDED HIGHT 39 (QTY 2)

1 - WORK ORDER ID#: 148993

2 - WORK ORDER ID#: 148710

ITEM ID: D412-664-403 412 STAINLESS STEEL AFT CROSSTUBE - HIGH (QTY 1)

3 - WORK ORDER ID#: 139982

ITEM ID: D407-667-205 AFT CROSSTUBE - HIGH 407 (QTY 5)

4 - WORK ORDER ID#: 148760

5 - WORK ORDER ID#: 148773

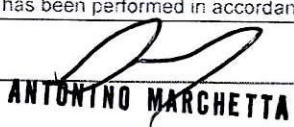
6 - WORK ORDER ID#: 148759

7 - WORK ORDER ID#: 148761

8 - WORK ORDER ID#: 148758

Action Taken:						Date:	Initial/Stamp:
LIQUID PENETRANT INSPECTION CARRIED OUT ON ITEMS LISTED ABOVE (ITEMS 1-8) AS PER ASTM1417M-13						JUL 26 2016	 DOT-APP 61 53-89
NO CRACK FOUND							
Pen: ZL-27A MWO5678 DEV: SKD-S2 MPO11715 CLEANER: SKC-S MPO13923 UV LIGHT M-20192							
Description	Location	P/N	Qty	Batch	S/N Off	S/N On	

I certify that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature:	 ANTONINO MARCHETTA	ACA/SCA Stamp	Date:
Name:			JUL 26 2016



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO33169**

Purchase Order Date 7/26/2016

PO Print Date 7/26/2016

Page Number 1 of 4

Order From :

VC-SKY001

SKYSERVICE
6120 MIDFIELD ROAD
MISSISSAUGA, ONTARIO L5P 1B1
CANADA

Ship To : DART AEROSPACE LTD
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name

Vendor Phone 905-678-5636

Ship To Contact

Ship To Phone

Ship Via: Delivered

Ship Acct:

Buyer

Customer POID

Customer Tax # 10127-2607

Terms Net 30

Currency CAD

FOB FCA - (Free Carrier)

Line Nbr	Reference Vendor Part Number Line Comments Delivery Comments	Description/ Mfg ID	Req Date/ Taxable Promise Date	CD	Req Qty/ Unit of Measure	PO Unit Price	Extended Price
1	71401-45	Procurement Quality Clause	7/26/2016		1.00	\$0.00	\$0.00
			No 7/26/2016				
	Procurement Quality Clauses A005 right of entry A012 chemical and physical test report A016 personnel qualification A017 raw material identification (as applicable) A026 certification of material conformance A041 quality management system A042 dart notification by supplier A043 retention of quality document						
Line Total:							\$0.00
2	148758	D407-667-205	7/26/2016		1.00	\$125.00	\$125.00
			No 7/26/2016				
	LIQUID PENETRANT INSPECTION AS PER QSI 038 OR LPI AS PER ASTM 1417 LEVEL 2						

Note:

7/26/2016



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO33169**

Purchase Order Date 7/26/2016

PO Print Date 7/26/2016

Page Number 2 of 4

Order From :

SKYSERVICE
6120 MIDFIELD ROAD
MISSISSAUGA, ONTARIO L5P 1B1
CANADA

VC-SKY001

Ship To :

DART AEROSPACE LTD
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name

Vendor Phone 905-678-5636

Ship To Contact

Ship To Phone

Ship Via: Delivered

Ship Acct:

Buyer

Customer POID

Customer Tax # 10127-2607

Terms Net 30

Currency CAD

FOB FCA – (Free Carrier)

Line Total: **\$125.00**

3	148761	D407-667-205	7/26/2016 No 7/26/2016	1.00	\$125.00	\$125.00
---	--------	--------------	------------------------------	------	----------	----------

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Line Total: **\$125.00**

4	148759	D407-667-205	7/26/2016 No 7/26/2016	1.00	\$125.00	\$125.00
---	--------	--------------	------------------------------	------	----------	----------

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Line Total: **\$125.00**

5	148773	D407-667-205	7/26/2016 No 7/26/2016	1.00	\$125.00	\$125.00
---	--------	--------------	------------------------------	------	----------	----------

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Note:

7/26/2016



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO33169**

Purchase Order Date 7/26/2016

PO Print Date 7/26/2016

Page Number 3 of 4

Order From :

VC-SKY001

SKYSERVICE
6120 MIDFIELD ROAD
MISSISSAUGA, ONTARIO L5P 1B1
CANADA

Ship To : DART AEROSPACE LTD
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name

Vendor Phone 905-678-5636

Ship To Contact

Ship To Phone

Ship Via: Delivered

Ship Acct:

Buyer

Customer POID

Customer Tax # 10127-2607

Terms Net 30

Currency CAD

FOB FCA - (Free Carrier)

Line Total: \$125.00

6	148760	D407-667-205	7/26/2016 No 7/26/2016	1.00	\$125.00	\$125.00
---	--------	--------------	------------------------------	------	----------	----------

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Line Total: \$125.00

7	139982	D412-664-403	7/26/2016 No 7/26/2016	1.00	\$125.00	\$125.00
---	--------	--------------	------------------------------	------	----------	----------

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Line Total: \$125.00

8	148710	D412-596-203	7/26/2016 No 7/26/2016	1.00	\$125.00	\$125.00
---	--------	--------------	------------------------------	------	----------	----------

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Note:

7/26/2016



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO33169**

Purchase Order Date 7/26/2016

PO Print Date 7/26/2016

Page Number 4 of 4

Order From :

SKYSERVICE
6120 MIDFIELD ROAD
MISSISSAUGA, ONTARIO L5P 1B1
CANADA

VC-SKY001

Ship To :

DART AEROSPACE LTD
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name

Vendor Phone 905-678-5636

Ship To Contact

Ship To Phone

Ship Via: Delivered

Ship Acct:

Buyer

Customer POID

Customer Tax # 10127-2607

Terms Net 30

Currency CAD

FOB FCA - (Free Carrier)

Line Total: **\$125.00**

9	148993	D412-596-203	7/26/2016	1.00	\$125.00	\$125.00
			No			
			7/26/2016			

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Line Total: **\$125.00**

PO Total: **\$1,000.00**

Note: Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.

Change Nbr: 3

Change Date: 7/26/2016